India partners in the international programme 'Universal Library'

The 'Universal Library' is hosted by Carnegie Mellon University, USA on the web (www.ulib.org). According to the web page, Andrew Carnegie and other philanthropists recognized 'the potential of public libraries to improve quality of life and provide opportunity to citizenry'. The ultimate aim is to digitally preserve both literary and scientific works and make them freely accessible in any geographic location.

For a start, the 'One million book digital library project' hopes to render one million books 'free to read, searchable collection' over the Internet in about four years time and in the next ten years, a further ten million books based on OCR (optical character recognition) technology would be created using a searchable index. This would strengthen language-processing research in areas such as machine translation, summarization, intelligent indexing and information retrieval, with the Universal Library 'mirrored at several locations worldwide'. Finally, the target is to 'capture all books in the digital format'. When finished, the million book project would have created approximately 250 million pages or 500 billion characters of information.

In May 2002, India decided that one of the Central Government agencies would take over the 'Million Book Initiative' in India, and would form a consortium for taking into account 'technological challenges, legal and copyright issues, selection of books, meta data standards, search engines and server management'. Alongside China and USA, India's participation in the 'Consortium for Compensating for Creating Contents' (4Cs) is through the following organizations: Arulmigu Kalasalingam College of Engineering; Goa University; Indian Institute of Information Technology, Allahabad; Indian Institute of Science (IISc), Bangalore; International Institute of Information Technology, Hyderabad; Shanmugha Arts, Science, Technology and Research Academy, Tirumala Tirupati Devasthanams; Maharashtra Industrial Development Corporation, Mumbai, and the University of Pune.

According to N. Balakrishnan, IISc, a key player in this innovative project, it is a 'logistical challenge' that involves scanning a million books with over 400 million pages. For archiving journals of the Indian Academy of Sciences, Bangalore on the web, Minolta PS7000 scanners were used that adjust to the curvature of the paper, and about 8000 pages could be scanned in a day, followed by image-cropping and cleaning with software developed by Carnegie Mellon University and IISc. The image-processing software caters to curvature correction, cropping for thick books to be scanned flat, with little damage to the binding.

Methodology: The first step is in creating a virtual central database that is globally accessible. Availability is to be ensured by mirroring the database worldwide. A single book could have 60 megabytes of information stored as both text and image files. Projected cost of on-line storage of about 100 terabytes would be about US $5000 in three years time. The next steps are scanning and data production with high resolution, allowing reading of the original pages of a book directly on a computer screen. Software would help in 'links' and navigation through the book. Books loaned from libraries would be transported, scanned and returned to the home library. India and China have already shown that high-quality scanning in the first instance is possible. The project would help in the development of OCRs in Indian languages and provide an impetus for multilingual summarization and translation tools. Due to the large number of languages and scripts found in India and a great number of characters to be recognized, the whole exercise for Indian languages would be complicated. Since it is hoped that at least 10,000 books out of the million books would be in languages other than English, this would increase research efforts in example-based machine translation.

Benefits: People all over the globe would significantly gain from the success of the project. First, it would help preserve both old and new books, and for researchers, it would reduce reference times. It would certainly not sound the death knell for printed books. In fact, browsing through the digital library would possibly only increase the desire to own and read books. It would mean giant strides in the field of education, providing free access to expensive or rare books. Just as free software available on the web has contributed to society and also increased sales, similar patterns are expected from literary and scientific publications freely available on the web.

India is sure to reap the benefits of joining this international effort and accelerate research in new areas arising from the needs of the project. It is hoped that with the active support from the Government of India, textbooks for school curriculum by organizations such as National Council of Educational Research and Training, could be scanned and put on the web so that students could freely access their contents. What a change this could bring about to literacy levels, provided that this is amply supported by computers and internet connections! Another direct benefit would be cost-saving from directly creating contents on the web, for freely sharing it, rather than in commissioning and writing printed books.

Balakrishnan felt that there was enormous scope for supplementing education in the country through this project. For example there were 4.2 million books in IISc library that could be made available. There would be no attempt to spend time or energy in selecting books for scanning, and a policy of 'take books as they come' would be adopted. He said that the project achievers would not take a backseat but would act as agents of change, with intermediaries in the information cycle disappearing. Other projects for scanning art works and literary works of India could be taken up by interested parties, just as is being done for scientific works. Indian manuscripts now in South East Asia could also be scanned and made available to Indians through this project, he added. As for copyright laws, he felt that this initiative driven by the consumer would put pressure on the copyright law to be withdrawn. There

were also plans to attract publishers to the scanning of their out-of-print but in copyright book titles. Copyright concerns and publishers may prove the biggest hurdle and these would be increasingly known in the years to come.

People in both developed and developing countries have much to look forward to in this concept of 'Universal Library'. The spirit of sharing and better times ahead for many fund-starved institutions in India, where library facilities are greatly inadequate, would be facilitated.

Nirupa Sen

Kalam addresses Space summit at the Indian Science Congress

It was a first that a Space summit was held in the history of the Science Congress. There was representation at the summit, part of the Indian Science Congress held in Bangalore, from many foreign space agencies including those from United States of America, France, Thailand and China. It was a first in that any President of India had not only attended the Space summit special session but also delivered the Space summit address titled 'Vision for the global space community: Prosperous, happy and secure planet Earth'. A. P. J. Abdul Kalam, who had himself been a part of the Indian Space Research Organization had some suggestions for the global space community. He highlighted his dream of alleviating the pain and problems faced by people in this country and those facing similar problems elsewhere. One solution he felt strongly about was the use of space technology in addressing the problems of social relevance towards national developmental goals. Science and technological inputs are vital to a country's development. Efficient utilization of the existing knowledge leads to wealth

generation and this is where space technological tools play a vital role. Kalam said that 'space technology integrated with information and communication technologies would spearhead our march towards a knowledge society'.

Kalam reiterated that 'it is only international cooperation that can yield shared benefits beyond expendable launch vehicles and spacecraft in areas such as tele-education, connectivity for community development, etc.' He cited that global space market trends would show a decline in business volumes from the current US$ 32 billion per year to US$ 16 billion per year by 2010. The Indian concept of hyper plane, a fully reusable system, is an innovation in rocketry providing a payload fraction of 15%, drastically reducing the launch cost to 1/50 of the current cost elsewhere, he added. Hence he felt it was an opportune time for countries to join with India to launch major universal missions. A global effort was needed, said Kalam, for demonstrating low cost access to space. By building an integrated joint global strength, opportunities for attaining the

full potential of space research and building of a joint consortium of space industry could be plausible in the future.

Finally, Kalam asked the Space summit to address itself for initiating a movement towards a Common Minimum Global Space Mission with a 50-year perspective for international cooperation to tackle issues concerning impending human crisis for energy, water and minerals. This could be in the form of an International Space Force made up of all space-faring nations of the world willing to participate and contribute to protect world space assets, said Kalam. India having considerable infrastructure and experience in the use of space for sustainable economic development could lead from the front to establish a consortium of space agencies for future global missions.

Nirupa Sen, 1333 Poorvanchal Complex, JNU New Campus, New Delhi 110 067, India.
e-mail: nirupasen@vsnl.net

SciDev.Net completes one year

The SciDev.Net website has just completed one year of its formation. During the year 2002 several useful initiatives were undertaken by the organizers of this website. David Dickson, Director, SciDev.Net has stated that 'We would like more people to know about SciDev.Net and, in particular, about the free, weekly e-mail alert that we offer as a way of keeping up to date with new material on the website

(including the access that we provide to selected articles from *Nature* and *Science*)'.

The following excerpted text gives some details: 'The Science and Development Network (SciDev.Net) is an organization that promotes the communication of information about science and technology relevant to the needs of developing countries. Our main activity is running a web-

site http://www.scidev.net that provides a regularly updated source of news, views and information on topics ranging from climate change and genetically modified crops to intellectual property and the ethics of medical research.

SciDev.Net was set-up with the support of journals *Nature* and *Science*, both of which allow us to provide free access to selected articles each week. One impo-